

## 2. Games, Learning, and Education

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What Is A (Good) Game?

## One of The Best Videogames of All Time: *Pitfall*

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## One of The Worst Videogames of All Time: *ET*

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## Games and Boredom (Koster)

When Players Say...	...They Mean
The game is too easy	Game patterns are too simple
The game is too involved	Players are uninterested in the information required to detect patterns
The game is too hard	Patterns are perceived as noise
The game becomes too repetitive	New patterns are added too slowly
The game becomes too hard	New patterns are added too fast
The game runs out of options	All game patterns are exhausted

Raph Koster, Theory of Fun for Game Design. Paraglyph. (2004)

## Successful Games

Include These Items...	...To Avoid
Preparation before challenges	Results due to pure chance
A sense of a game space	The perception of the game as trivial
A solid core mechanic	The game not being perceived as a game at all
A range of challenges	The game being exhausted too quickly
A range of required abilities	The game being perceived as simplistic
Skill in using the required abilities	The game being perceived as tedious

## Three More Key Items for Success

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You Need to Have...	...Because
Variable feedback	Players like to see greater skill result in greater rewards
A way to accommodate beginners and experts playing together	You don't want to see beginners get clobbered, and experts "bottom feed"
A definite cost for failure	Players feel cheated by "never-lose" games

## The Ethical Dimension



## Similar Actions – Different Worlds

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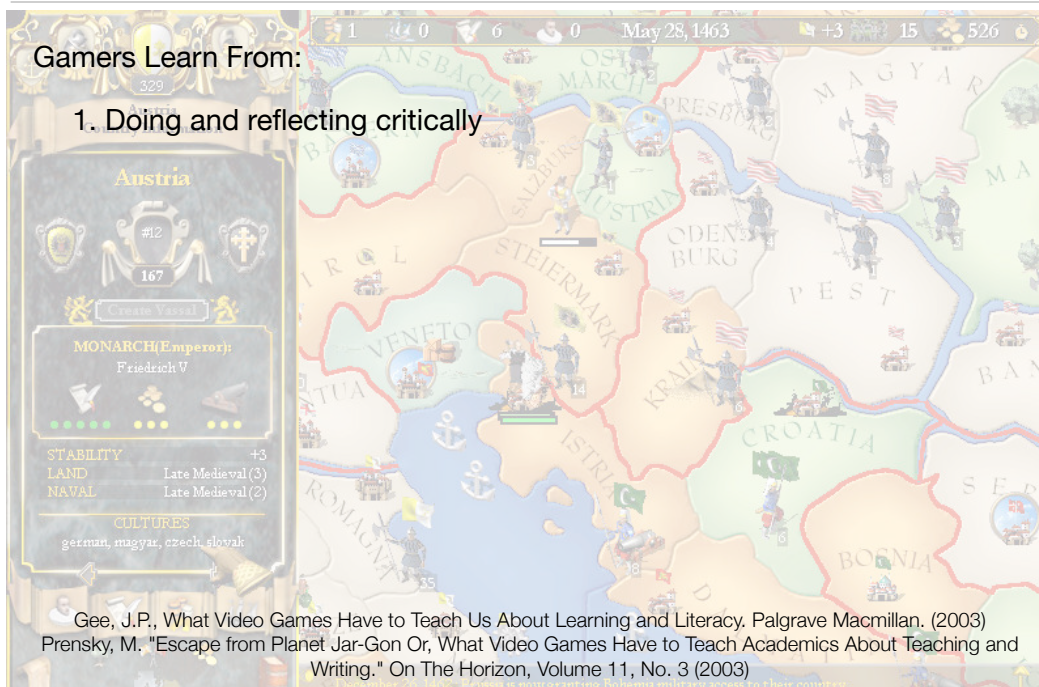


Videogames and Learning

## Active Learning (Gee)

Gamers Learn From:

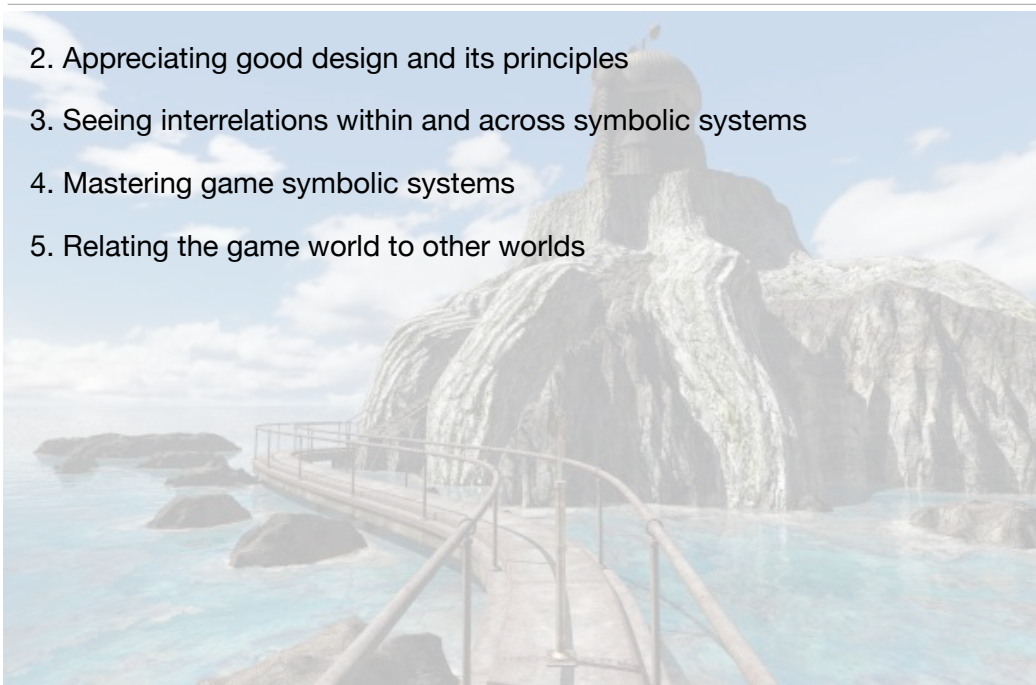
### 1. Doing and reflecting critically



Gee, J.P., What Video Games Have to Teach Us About Learning and Literacy. Palgrave Macmillan. (2003)  
Prensky, M. "Escape from Planet Jar-Gon Or, What Video Games Have to Teach Academics About Teaching and Writing." On The Horizon, Volume 11, No. 3 (2003)

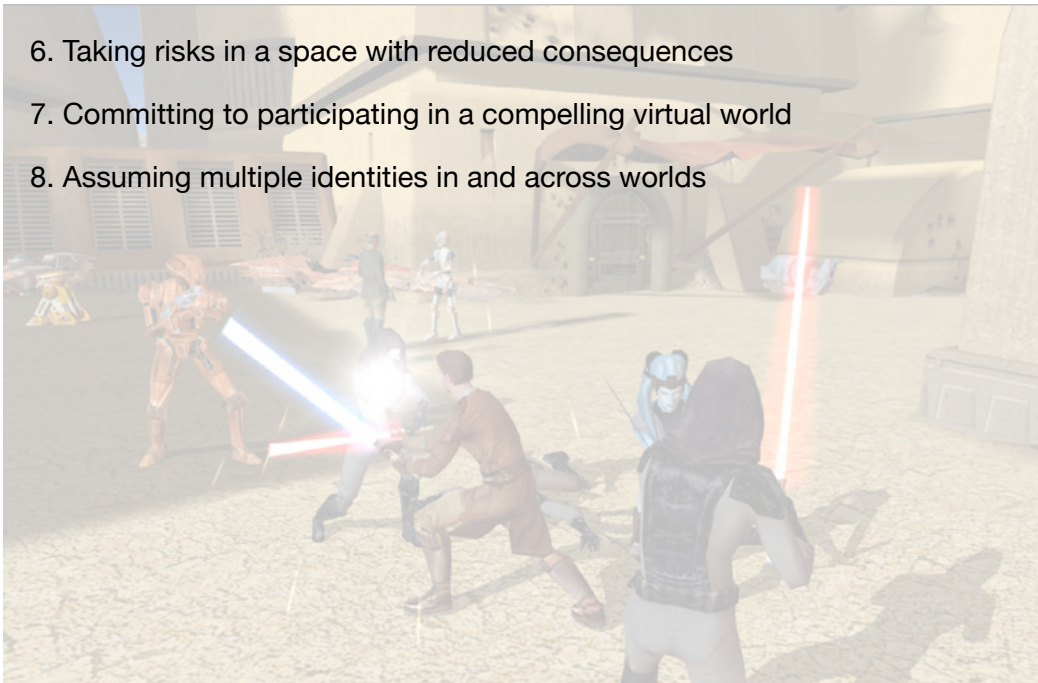
## Symbolic Systems

2. Appreciating good design and its principles
3. Seeing interrelations within and across symbolic systems
4. Mastering game symbolic systems
5. Relating the game world to other worlds



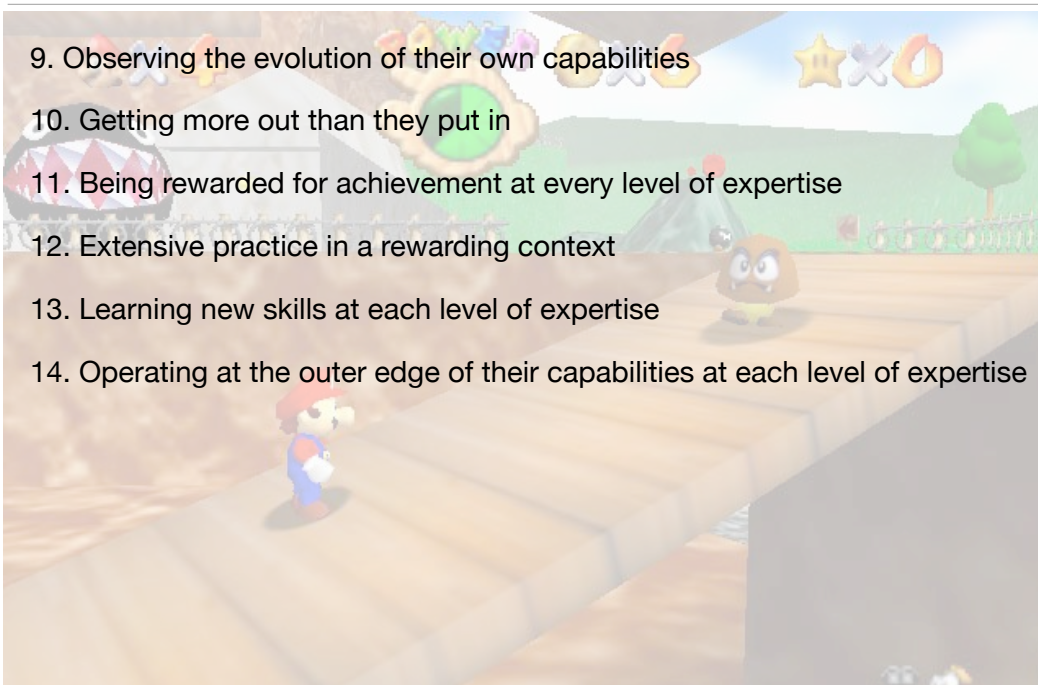
## Worlds and Identities

6. Taking risks in a space with reduced consequences
7. Committing to participating in a compelling virtual world
8. Assuming multiple identities in and across worlds



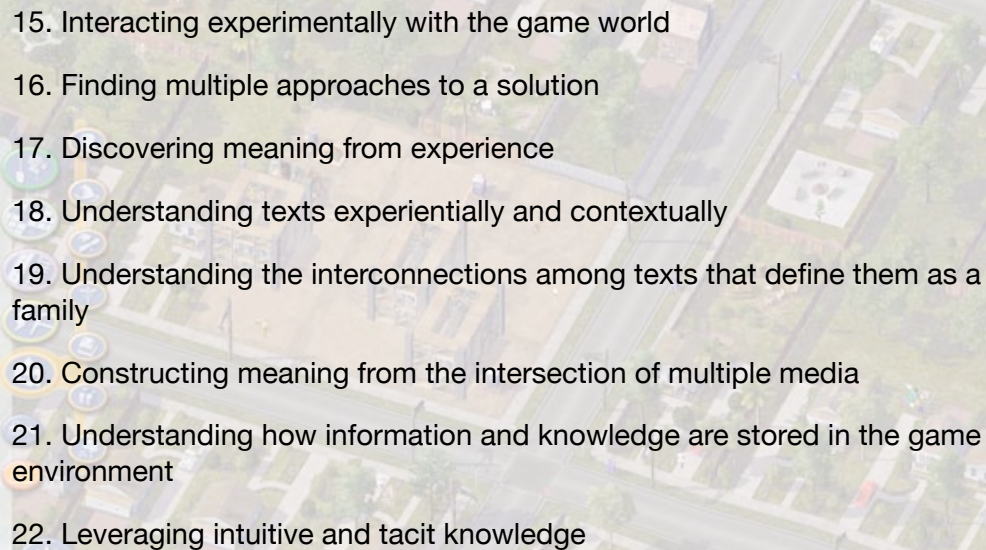
## Development of Capabilities

9. Observing the evolution of their own capabilities
10. Getting more out than they put in
11. Being rewarded for achievement at every level of expertise
12. Extensive practice in a rewarding context
13. Learning new skills at each level of expertise
14. Operating at the outer edge of their capabilities at each level of expertise

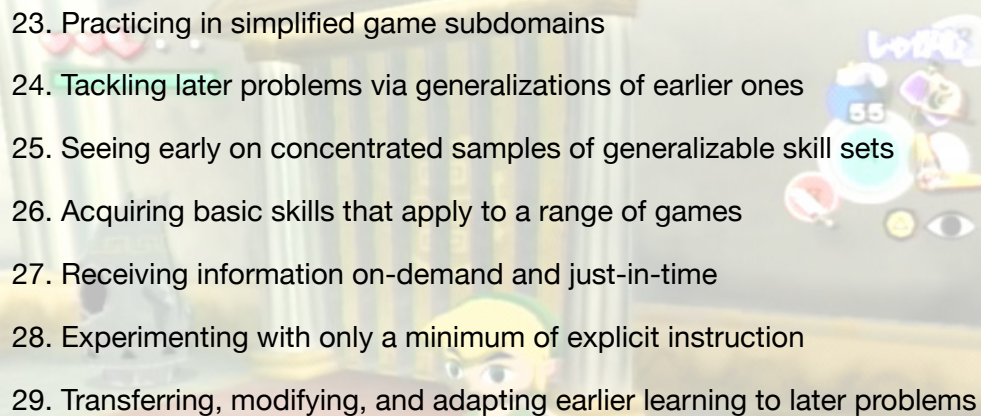




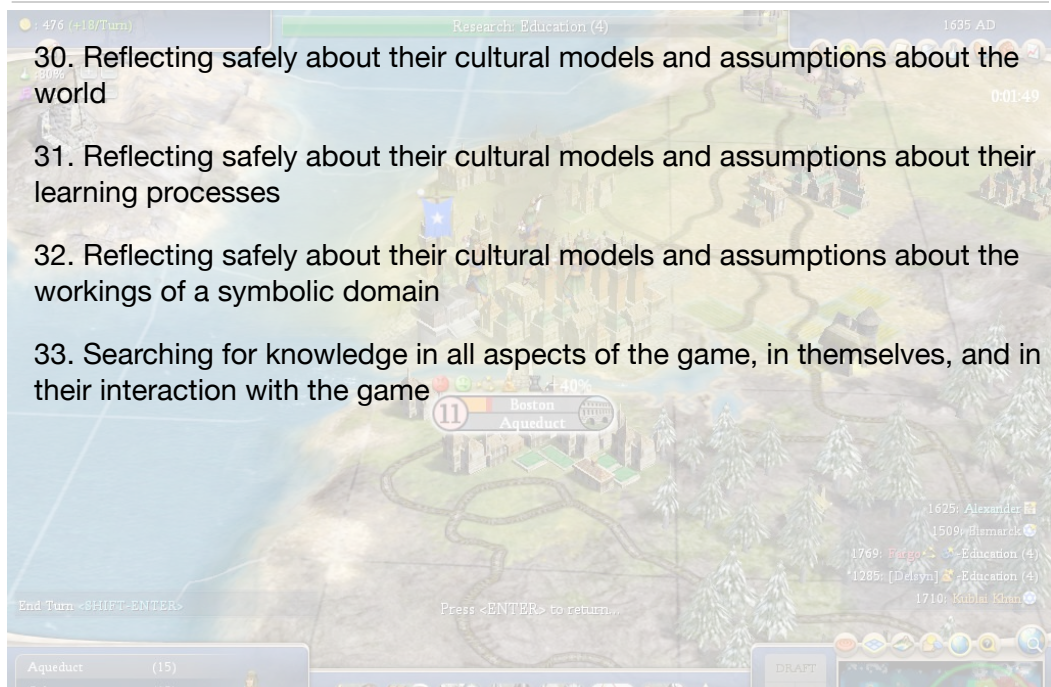
## Experiential Learning

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15. Interacting experimentally with the game world
  16. Finding multiple approaches to a solution
  17. Discovering meaning from experience
  18. Understanding texts experientially and contextually
  19. Understanding the interconnections among texts that define them as a family
  20. Constructing meaning from the intersection of multiple media
  21. Understanding how information and knowledge are stored in the game environment
  22. Leveraging intuitive and tacit knowledge

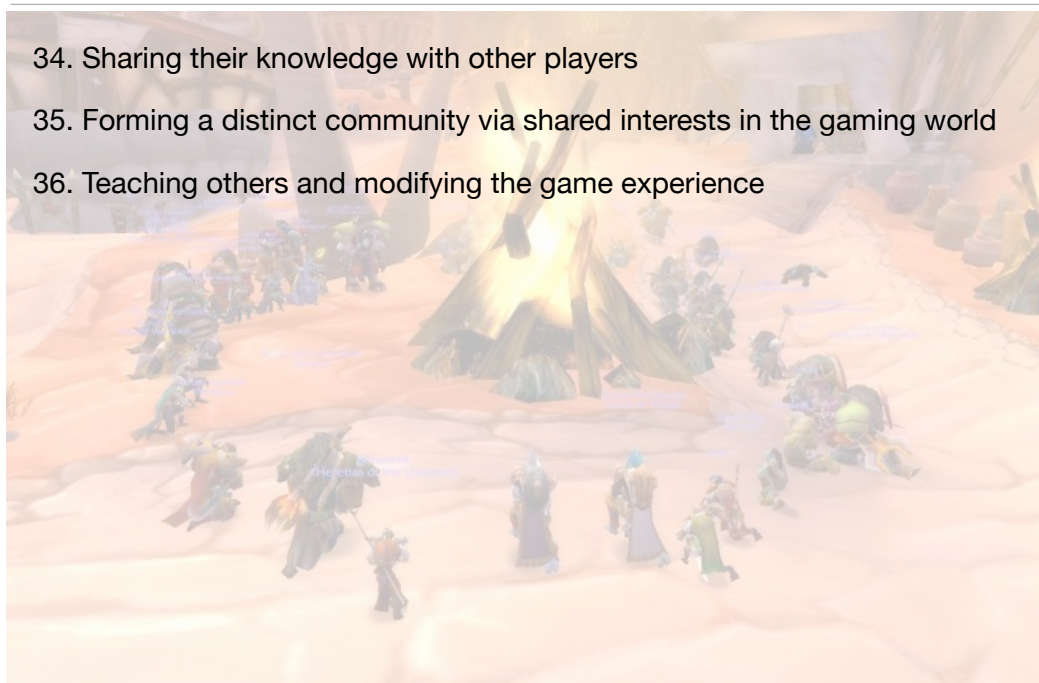
## Developing Skills

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23. Practicing in simplified game subdomains
  24. Tackling later problems via generalizations of earlier ones
  25. Seeing early on concentrated samples of generalizable skill sets
  26. Acquiring basic skills that apply to a range of games
  27. Receiving information on-demand and just-in-time
  28. Experimenting with only a minimum of explicit instruction
  29. Transferring, modifying, and adapting earlier learning to later problems

## Cultural Models



## Community



## Videogames and Education

### Effectiveness of Games in Education (Randel, Morris, Wetzel & Whitehill 1992)

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- Meta-study of 68 studies from 1963-1991
  - Social sciences; mathematics; language arts; logic; physics; biology
- Most effective: language arts and mathematics
  - 12 out of 14 studies showed positive results
- Next most effective: social sciences
  - 13 out of 46 showed positive results
  - 33 out of 46 were as effective as traditional methods
- Game learning overall showed better retention than traditional learning
- Students showed greater interest in topics taught via games or simulations

Randel, J.M., B.A. Morris, C.D. Wetzel, and B.V. Whitehill. "The Effectiveness of Games for Educational Purposes: A Review of Recent Research." *Simulation & Gaming* 1992 (Volume 23):261-276

## Recent Research (Fletcher & Tobias 2006)

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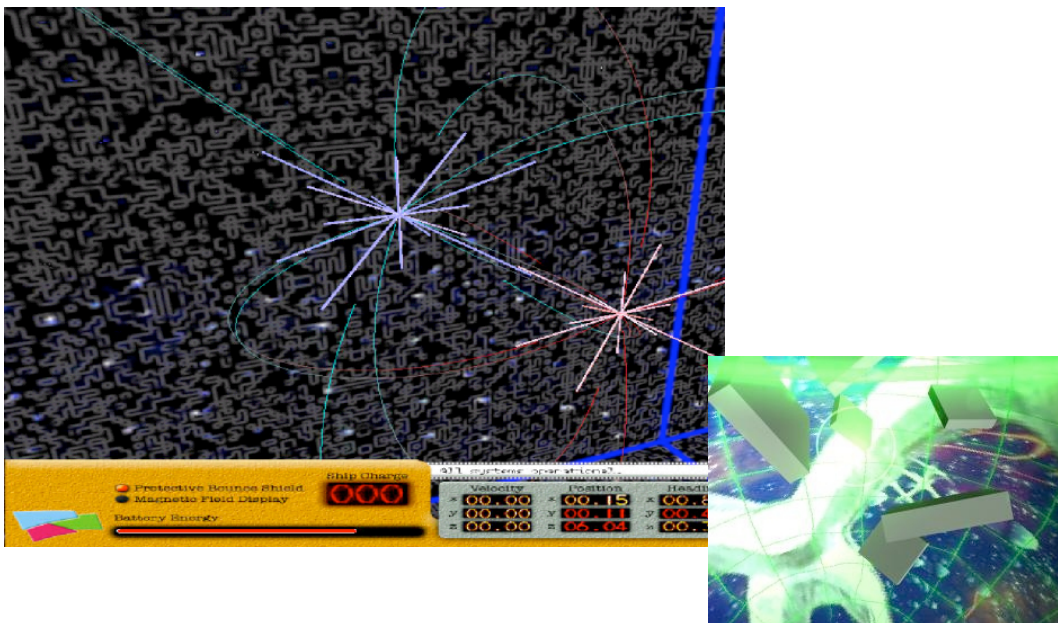
- Review of research from 1992-2005
  - 42 papers directly related to use of games in instructional settings
- Topics:
  - Transfer to Real-Life Tasks: 5 positive, 1 neutral, 1 mixed
  - Facilitating Performance, Learning, and Transfer: 4 positive
  - Transfer to Related Tasks or Domains: 8 positive, 1 neutral
  - Effects on Different Variables: 5 positive
  - Effects on Cognitive Processes: 9 positive
  - Team Characteristics of Game Players: 1 positive, 2 mixed
  - Motivational Effects: 3 positive, 2 mixed

Fletcher, J.D. and S. Tobias. "Using Computer Games and Simulations for Instruction: A Research Review."  
Proceedings of the Society for Advanced Learning Technology Meeting (February 2006)

## Three Exemplary Projects

## Project 1: A “Twitch” Game for Physics

### Twitch Educational Game: *SuperCharged!*



Source: <http://educationarcade.org/supercharged>



## Project 2: A Massively Multiplayer Online Game for History

### MMOG Educational Game: *Revolution*

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Source: <http://www.educationarcade.org/revolution>

## Some More Screens From *Revolution*



## Project 3: Interactive Fiction for Literature

# An Interactive Fiction Performance: *Tempest*

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All hail, great master! grave sir, hail! I come  
To answer thy best pleasure: be't to fly,  
To swim, to dive into the fire, to ride  
On the curl'd clouds, to thy strong bidding task  
Ariel and all his quality.

## THE TEMPEST

An interactive performance  
(Please type "front" for the Frontispiece.)  
Release 3 / Serial number 970929 / Inform v6.14 Library 6/7

### On the curl'd clouds

...to tread the ooze  
Of the salt deep,  
To run upon the sharp wind of the north,  
To do business in the veins o' the earth  
When it is baked with frost.

>north

### A thousand furlongs of sea

Lay broad the tumbling billows of the main.

Abeam, the king's ship plies the quiet wave.

>blow ship  
Jove's lightnings, the precursors  
O' the dreadful thunder-claps, more momentary  
And sight-outrunning were not; the fire and cracks  
Of sulphurous roaring the most mighty Neptune  
Seem to besiege and make his bold waves tremble,  
Yea, his dread trident shake!

### A thousand furlongs of sea (in guise of an airy spirit)

The sky, it seems, would pour down stinking pitch,  
But that the sea, mounting to the welkin's cheek,  
Dashes the fire out.

Abeam, the king's ship founders on the wave.

[Your score has increas'd a point.]

>|

Source: <http://www.wurb.com/iff/game/316>

# Exploring Poetic Language: *For A Change*

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The sun has gone. It must be brought. You have a rock.

## For A Change

For A Change, v1.02  
Dan Schmidt: <dflan@alum.mit.edu>  
Release 1 / Serial number 990930 / Inform v6.21 Library 6/9

### Under the High Wall (on the resting)

Sweetness fills the shade of the High Wall to your east. Under this sweetness lies a small expanse of fod. A mobile releases mildly to the west; far in that direction a tower proudly plants itself, while the ground rises more slowly to the south and relaxes to the north.

Spread on the resting is a guidebook.

Sleep gradually departs from your eyes. A small stone has been insinuated into your hand.

>examine stone  
It is a small smooth stone, the size of a small gland, a size to roll between your fingertips, nothing more than a pebble.

>get up  
The resting sighs at your departure.

>read guidebook  
The guidebook inflates itself with numerous definitions.

>west

### In the Shade

The land increases towards your head to the south, and decreases away from your feet to the north. Mobiles lead accordingly in both directions. The High Wall may also be approached to the east. A long walk to the west is a tower, dwarfing your form, and dwarfed in turn by the wall.

It is clear, after a time, that all things are shaded, everywhere. Thus the Wall.

Inscribed on the brown grass is a toolman.

>examine toolman  
The toolman is bright and misty. Thoughts and uses hang from his shoulders like birds.

>|

Source: <http://www.wurb.com/iff/game/605>

# Hippasus

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